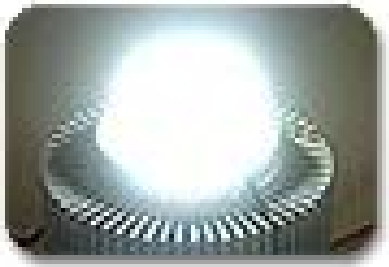
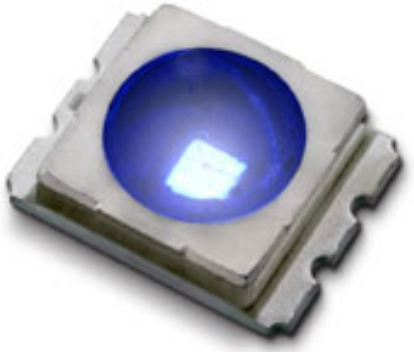
LED Standards and Test Methods Development

Progress and Current Status



Eric Richman, LC
Pacific Northwest National Laboratory
July 17, 2006

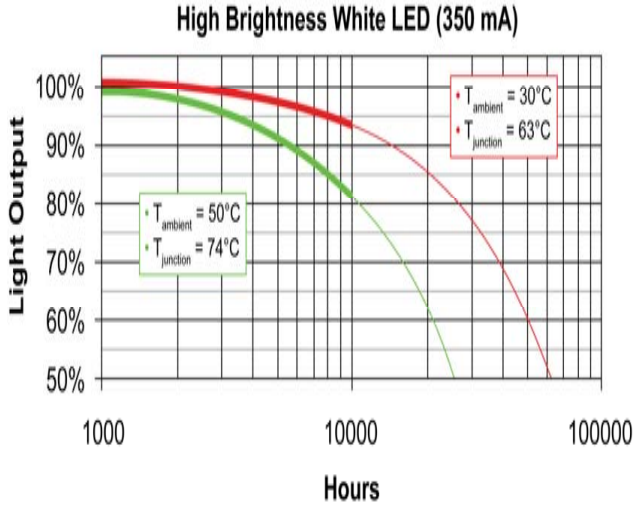


Issues – driving the need for standards

- **Energy efficiency** - competing with FL and other sources
- **Life** – need a better metric than failure
- **Heat effects**
  - Performance degradation
  - Useful life

…plus….

- **Color Preference**
  - Market needs
  - Cost



DOE Sponsored Standards Workshop - March 1, 2006

- Gathering of all standards and test methods organizations
- Review of LED standards and methods needs
- Review of development process and impacting timelines
- DOE providing on-going technical support for standards development.

Major Workshop Results

1) Standards and Test Method Needs Identified for Industry as well as Energy Star:
   - Photometric measurement
   - Electrical measurements
   - Life-testing
   - Chromaticity
   - Definitions

2) Standards development timeline
   - Typically measured in years but interest among individual members in moving faster
   - Standards groups chose the DOE Energy Star timeline as their development goal – striving for standards in the 2007 timeframe.

3) Memorandum of Understanding between IESNA and DOE

4) Assignment of Standards and Methods development responsibility

- ANSI and IESNA to work together on major development
- Working groups formed
  - Luminous Flux
  - Power
  - Color/Chromaticity
  - Definitions
  - Calibration of Equipment
  - Defined UL conditions of Acceptability
  - Mechanical and Electrical interchangeability

Working Group Activity – 2006/2007

- ANSI/IESNA combined meetings
  - Report on progress of working groups
  - Address combined issues – monitor development in meeting industry and Energy Star needs
  - Identify process support needs to DOE

- ANSI/IESNA specific group conference calls
  - Continue specific group development
  - Consider manufacturer issues and market needs
  - NEMA and DOE hosted calls

Performance Standards and Test Methods Under Development – 2006/2007

- ANSI C78.377 Specification for Chromaticity of White SSL Products
  IESNA LM-79 Electrical and Photometric Measurements
- IESNA LM-80 Lifetime
- IESNA RP-16 Nomenclature/Definitions for Illuminating Engineers
- ANSI C82.XX1 Power Supply
- UL “Outline of Investigation”

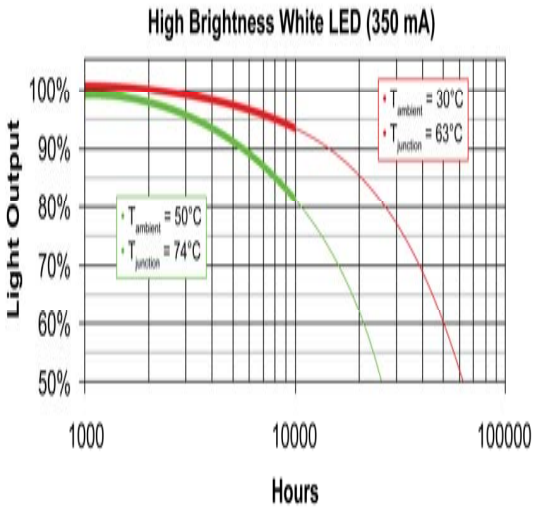
IESNA LM-79 - Electrical and Photometric Measurements

- Method for performing reproducible measurements of total flux, electrical power, efficacy (lm/watt), and chromaticity
- Applies to LED luminaires as well as LED sources used in luminaires (e.g., replacement of screw base incandescent lamps)

Status: currently in final edits – expected to go out for final ANSI ballot in July - Expected publication by December.

IESNA LM-80 - Lumen Depreciation (Lifetime) Test Method

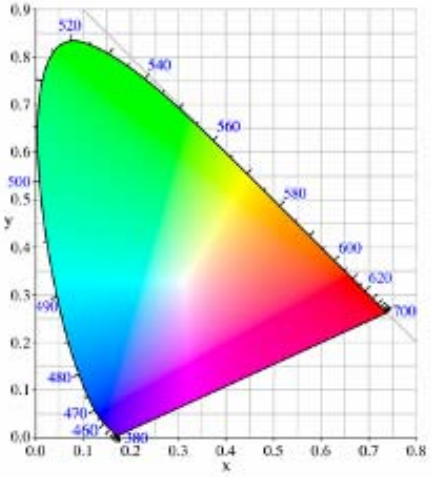
- Addresses lumen depreciation testing of solid-state (LED) light sources, arrays and modules only
- Does not cover measurement of luminaires.
- Incorporates the LRC ASSIST LM-50, LM-70 metrics



Status: currently in final edits – expected to go out for final ANSI ballot in July - Expected publication in by December.

ANSI C78.377 - Specification for Chromaticity of White SSL Products

- Specifies the range of chromaticities recommended for general lighting
- Applies to general indoor applications and some outdoor applications where white light is critical.



Status: Final edits complete – going out for final ANSI approval in July with expected publication by December.

IESNA RP-16 - Nomenclature/Definitions for Illuminating Engineers

- A revision to the current RP-16 document
- Revision will define appropriate LED related terms.

Status: currently tentatively accepted by IESNA for inclusion as addendum.

ANSI C82.XXX – LED Drivers

- Provides specifications/operating characteristics of electronic drivers for LED devices, arrays, or systems
- Applies to drivers operating up to 600V and 50/60 hertz

Status: currently in draft review by working group

UL "Outline of investigation" for LED products

- The "Outline" Coordinates existing UL standards as applicable to LEDs
- UL Standards technical panel being formed to support development of UL 8750 for LED products
- ANSI/IESNA working group now forming to draft proposed LED safety considerations for possible UL use.

Status: currently in progress.

Development Process Involvement

Both ANSI and IESNA processes are always interested in useful participation

- For ANSI, contact Ron Runkles - ron_runkles@nema.org
- For IESNA, contact Kevin Dowling - kevin@colorkinetics.com
- For UL, contact Eli Puszkar – eli.puszkar@us.ul.com